

**COLUMBIA RIVER WATER MANAGEMENT GROUP
MEETING NO. 495**

1. ATTENDANCE

The following met at 9:30 a.m., on Thursday, September 10, 1998, in the Custom House, Portland, OR.

Members or Alternates Present

Cathy Hlebechuk, Corps of Engineers
Ted Day, US Bureau of Reclamation (phone)
David Westnedge, National Weather Service-RFC
Ed Hubbard, U.S. Geological Survey
Doug McChesney, Washington Dept of Ecology
Roger Ross, Corps of Engineers

Others Present

(None)

Members Not Present or Represented

Nancy Stephan, Bonneville Power Admin
National Marine Fisheries Svc
Dan Moore, Natural Resources Conservation Svc
Jack Gakstatter, U.S. Environ'l Protection Agcy
Bruce McCammon, U.S. Forest Service
Walter Boyle, Federal Energy Regulatory Comm
Marvin Yoshinaka, U.S. Fish and Wildlife Service
Bill Brooks, Bureau of Land Management
B Ondrechen, Idaho Dpt Water Resources & Cons
Barry Norris, Oregon Dept of Water Resources
Mike Turnipseed, Nevada State Engineer
Gordon Fassett, Wyoming State Engineer
Jack Stults, Montana Dept of Natural Res & Cons

2. WEATHER SUMMARY

During July had hot, dry conditions prevailed on the westside plus the upper Snake while hot, moist conditions produced convective activity on the east side as reported by Dave Westnedge (Enc 1). Sub-basin rainfall ranged from 24% of normal in the Southwest/Cowlitz and 29% in the Willamette Valley to 222% in the Burnt/Grande Ronde sub-basin of northeastern Oregon. The area with well above normal rainfall included the region east of the Cascades except for the upper and middle Snake and the Columbia drainage above Arrow Lakes. August was hot and dry with many daily maximum temperature records set at individual stations and only five of the 27 sub-basins having 50% or more monthly rainfall and seven having a single digit percentage.

Monthly precipitation for July and August was 140% and 48% of normal, respectively, for the Columbia River above Grand Coulee; 118% and 42% of normal for the Snake Basin above Ice Harbor; and 133% and 38% for the basin above The Dalles. **Seasonal** precipitation Oct-Jul and Oct-Aug was 102% and 98%, respectively, of normal for the Columbia River above Grand Coulee, 116% and 112% for the Snake Basin above Ice Harbor, and 106% and 102% for the basin above The Dalles.

3. STREAMFLOW

Ed Hubbard stated that streamflows throughout the Columbia Basin decreased seasonally during the months of July and August (Enc 2). Flows generally remained in the normal range for the two months and also for the water year-to-date. During this two-month period, flows ranged from a high of 169% of normal for the Chehalis River near Grand Mound, WA to a low of 53% for the Skykomish River near Gold Bar, WA. At the end of August, accumulated runoff for the water year-to-date ranged from a high of 125% for the Snake River at Weiser, ID to a low of 81% for the Middle Fork Flathead River near West Glacier, MT.

Adjusted streamflows for the months of July and August for the Columbia River at The Dalles were

219,000 cfs and 126,520 cfs, respectively. For the Willamette River at Salem the adjusted flows were 7,220 cfs and 4,760 cfs, respectively. At the end of August runoff for the water year to date for these two rivers was 104% and 97%, respectively.

4. SURFACE WATER SUPPLY INDEX

Oregon SWSI on 1 August indicated an abundance of water available in eight of the 14 water supply areas and on 1 September this had reduced to four of 14 (Enc 3). Even with this reduction there is an adequate water supply.

5. RUNOFF VOLUME FORECASTS

Dave Westnedge reported that runoff forecasts were generally within 10% of the observed runoff for the Columbia River at The Dalles and at Grand Coulee (Enc 4). The Snake basin was more of a problem because of the heavy summer rainfall which always compounds the errors. Not only must the excess rainfall be included in the forecasts but the reduction in the assumed irrigation withdrawal also adds to the forecast errors. Another problem with the forecasts from the high elevation stations is the increased glacier melt caused by the above average temperatures.

6. RESERVOIR OPERATION

Irrigation project supply met this year's demands and the carryover to next year appears to be excellent according to Ted Day (Enc 5). The high runoff this year accounted for the good supply and carryover.

Active content available on August 31 at **Franklin D. Roosevelt Lake** (behind **Grand Coulee Dam**) was 4,375,500 af--84% of capacity, 41,800 af less than last year, and 741,600 af less than normal. Active content of **Hungry Horse** was 2,645,300 af--89% of capacity, 2,258,800 af more than last year, and 259,500 af more than normal.

Cathy Hlebechuk summarized the operation of the Corps' projects (Enc 6). The TMT agreed to operate **Libby** between 12 and 18 kcfs in July. Between July 14 - 16, flow was reduced to 4 kcfs to assist authorities in recovering two drowning victims at Troy. The Libby/Arrow swap was again implemented this year in which the Canadians agreed to release water from Arrow in lieu of the Americans releasing water the full amount of water from Libby for salmon called for in the Biological Opinion. This resulted in a swap of about 210 kaf. The Libby elevation at the end of August was 2443.87 ft instead of a non-swap elevation of 2439 ft. During July and August **Lake Pend Oreille (Albeni Falls)** was operated within the top one half foot between elevations 2062.0 and 2062.5 ft. The average outflows in July and August were 30 kcfs and 14 kcfs, respectively. The annual September draft started on 8 September. **Dworshak** remained within one foot of full through July 10 when the TMT called for Dworshak to augment Lower Granite flows. By July 21 the outflow was increased to 20 kcfs where it was held through the end of July. On August 1 the outflow was decreased to minimum flow for two days to assist the sheriff in recovering a drowning victim. Outflows were increased again on August 3 to 14 kcfs (110% tgd) and were gradually reduced to 3 kcfs by the end of August. The pool drafted to 1520.32 feet by the end of August. At the **Lower Snake Projects**, Lower Monumental and Little Goose were operating at MOP to MOP + 1 as a soft constraint to submerge fish ladder entrances at Little Goose and Lower Granite in order to facilitate adult passage. Flip-lip construction work started again at Ice Harbor in September. All **Willamette projects** were operated in accordance with the summer flow augmentation plan in July and August. Salem and Albany flows did not drop below the minimum water quality flow targets in July or August. All but two projects are currently drafting for flood control. Construction projects at Fall Creek and Fern Ridge have delayed the fall draft until the end of November.

7. POWER OPERATIONS

No report

8. OTHER

It is time to begin thinking about the new WY 98 Blue Book. The announcement for agency contributions will go out next week.

The USGS announced the re-installation of two Oregon gaging stations: Mohawk River at Springfield (with local funding) and the Siuslaw River at Siuslaw (stage only with local funding). Both will be on GOES telemetry.

10. NEXT MEETINGS

The next meetings are tentatively scheduled for 9:30 am, in the Customs House, Room 118, on October 8, November 10, December 10, January 12, February 11, and March 11.

Roger L. Ross
Secretary

Enclosures

1. Weather Summary
2. Streamflow Summary
3. SWSI
4. USBR Project Summary
5. Corps Project Summary

ABRIDGED

WATER SUPPLY OUTLOOK

COLUMBIA RIVER AND PACIFIC COAST BASINS

July 1 and August 1, 1998

COLLABORATIVE AND SUPPORTIVE AGENCIES:

Northwest River Forecast Center, NWS
USDA/National Resource Conservation Service
US Army Corps of Engineers, North Pacific Division
US Bureau of Reclamation
British Columbia Hydro and Power Authority
Weather Services Directorate/Environment Canada
Local water district managers and utility companies

For more information, or to be included on the mailing list, please contact:

Northwest River Forecast Center
NOAA/National Weather Service
Attn: Tom Fero, Water Supply Coordinator or
Kyle Martin, **Water Supply Outlook** Technical Editor
Judith L. Garbutt, **Water Supply Outlook** Production Editor
5241 NE 122nd Avenue
Portland, Oregon 97230-1089

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Enc 1

COLUMBIA BASIN PRECIPITATION (MONTHLY SUMMARY)

NWS PORTLAND RIVER FORECAST CENTER - PORTLAND, OREGON
COLUMBIA BASIN DIVISION AVERAGES OF SEASONAL PRECIPITATION

DIVISION	..JUL TO DAY 31..			....OCT - JUL....		
	OBSD	DEP	PCT AV	OBSD	DEP	PCT AV
COLUMBIA ABOVE COULEE	2.24	.64	140.	22.62	.42	102.
SNAKE RV AB ICE HARBOR	.95	.14	118.	18.59	2.63	116.
COLUMBIA AB THE DALLES	1.45	.36	133.	21.82	1.17	106.
COLUMBIA AB CASTLEGAR	2.50	.04	102.	27.70	-1.79	94.
KOOTENAI	2.35	.66	139.	22.93	.55	102.
CLARK FORK	1.92	.88	185.	17.05	1.66	111.
FLATHEAD	2.11	.68	148.	20.81	.33	102.
PEND OREILLE/ SPOKANE	1.63	.61	160.	27.45	.30	101.
NORTHEAST WASHINGTON	1.70	.63	159.	21.55	4.78	128.
OKANOGAN	1.13	.12	112.	16.26	2.98	122.
EAST SLOPES WASH CASC.	1.00	.34	152.	37.26	1.03	103.
CENTRAL WASHINGTON	.30	.01	104.	8.80	.88	111.
UPPER SNAKE	.91	-.37	71.	20.78	2.45	113.
SNAKE RIVER PLAIN	.47	-.12	79.	11.52	1.43	114.
OWYHEE/ MALHEUR	.61	.14	129.	14.13	3.77	136.
SALMON/ BOISE/ PAYETTE	.79	.10	115.	21.07	2.66	114.
BURNT/ GRANDE RONDE	1.47	.81	222.	17.97	3.43	124.
CLEARWATER	1.96	.84	175.	28.16	.35	101.
SOUTHEAST WASHINGTON	1.10	.46	172.	17.05	.16	101.
UPPER JOHN DAY	1.20	.58	194.	15.97	2.41	118.
UMATILLA/ LWR JOHN DAY	.71	.25	154.	16.25	1.61	111.
UPR DESCHUTES/ CROOKED	.96	.45	189.	18.16	4.59	134.
HOOD/ LOWER DESCHUTES	.41	.00	101.	27.65	.94	104.
NW SLOPE WASH CASCADES	.88	-1.09	45.	72.84	-7.75	90.
SW WA CASCADES/COWLITZ	.30	-.97	24.	63.88	-1.65	97.
WILLAMETTE VALLEY	.22	-.52	29.	55.88	.45	101.
ROGUE/ UMPQUA	.06	-.30	18.	41.81	8.05	124.
KLAMATH BASIN	.47	.07	119.	22.20	5.37	132.
LAKE COUNTY-GOOSE LAKE	.30	-.13	71.	15.39	3.77	132.
HARNEY/ MALHEUR BASIN	.61	.16	135.	15.18	4.43	141.

DIVISION VALUES ARE COMPUTED BY USING UN-WEIGHTED PRECIPITATION AMOUNTS FROM KEY STATIONS IN EACH AREA. NORMALS BASED ON 1961-1990. FOR FURTHER INFORMATION CONTACT: NWRFC (503) 326-7291.

THE KILLING HEAT WAVE THAT BLASTED THE NATION REACHED THE PACIFIC NORTHWEST IN JULY. HOT, DRY CONDITIONS PREVAILED ON THE WEST SIDE PLUS THE UPPER SNAKE AND HOT, MOIST CONVECTIVE ACTIVITY SWEEPED THE EAST SIDE. MANY SITES REPORTED RECORD HIGH MINIMUM TEMPERATURES. MISSOULA HAD THEIR SECOND WETTEST JULY ON RECORD.

MEAN TEMPERATURES DEPARTED +3.5 DEGREES (30 STATIONS) FROM NORMAL FOR THE PACIFIC NORTHWEST RELATIVE TO 1961-1990 NORMALS. MEAN TEMPERATURE DEPARTURES

RANGED BETWEEN 6.8 AND -0.2 DEGREES. RECORD HIGHS SCORCHED PORTLAND ON THE 26TH (99 DEGREES) AND 28TH (101DEGREES), EUGENE ON THE 26TH (102 DEGREES) AND 27TH (105 DEGREES, TIED THE ALL TIME RECORD HIGH FOR JULY), AND POCA TELLO ON THE 17TH (102DEGREES). MANY IDAHO SITES SHATTERED OLD RECORD HIGHS. RECORD PRECIPITATION FELL AT MISSOULA ON THE 3RD (0.96 INCH) AND 5TH (1.00 INCH).

A TROUGH OF COOLER AIR SLOWLY MOVED OVER THE BASIN DURING THE FIRST WEEK BRINGING SCATTERED SHOWERS. SUMMER-TIME RIDGING ENSURED WARMER TEMPERATURES BY THE 8TH AND DOMINATED FOR WEEKS. THE PRESENCE OF AN ANCHORED SUB-ALEUTIAN LOW KEPT SOME COOLER AIR INJECTED INTO OUR WESTERLY FLOW, ALTHOUGH STRONG THERMAL LOWS AND RIDGING BROUGHT A NUMBER OF HOT DAYS. THE LAST DAYS OF JULY SAW STRONG CONVECTIVE STORMS MOVE ACROSS EASTERN WASHINGTON, NORTHERN IDAHO, AND MONTANA WITH RICH PRECIPITATION TOTALS.

FOR JULY...PRECIPITATION WAS 140 PERCENT OF NORMAL (1961-1990) AT COLUMBIA ABOVE COULEE; 118 PERCENT OF NORMAL AT THE SNAKE RIVER ABOVE ICE HARBOR; AND 133 PERCENT AT COLUMBIA ABOVE THE DALLES.

end/nwrfc/kmartin
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COLUMBIA BASIN PRECIPITATION (MONTHLY SUMMARY)

NWS PORTLAND RIVER FORECAST CENTER

COLUMBIA BASIN DIVISION AVERAGES OF SEASONAL PRECIPITATION

DIVISION	..AUG TO DAY 31..			....OCT - AUG....		
	OBSD	DEP	PCT AV	OBSD	DEP	PCT AV
COLUMBIA ABOVE COULEE	.81	-.87	48.	23.40	-.48	98.
SNAKE RV AB ICE HARBOR	.40	-.56	42.	19.03	2.11	112.
COLUMBIA AB THE DALLES	.47	-.77	38.	22.35	.46	102.
COLUMBIA AB CASTLEGAR	.89	-1.49	37.	28.59	-3.28	90.
KOOTENAI	.86	-.79	52.	23.78	-.25	99.
CLARK FORK	.91	-.41	69.	17.89	1.18	107.
FLATHEAD	.81	-.77	51.	21.69	-.37	98.
PEND OREILLE/ SPOKANE	.42	-.92	31.	27.72	-.77	97.
NORTHEAST WASHINGTON	.31	-.90	26.	21.88	3.90	122.
OKANOGAN	.21	-.95	18.	16.63	2.19	115.
EAST SLOPES WASH CASC.	.15	-.81	16.	37.19	.00	100.
CENTRAL WASHINGTON	.10	-.32	24.	8.83	.49	106.
UPPER SNAKE	1.12	-.25	81.	21.99	2.29	112.
SNAKE RIVER PLAIN	.24	-.47	34.	11.80	1.00	109.
OWYHEE/ MALHEUR	.04	-.57	6.	14.17	3.20	129.
SALMON/ BOISE/ PAYETTE	.26	-.58	31.	21.41	2.16	111.
BURNT/ GRANDE RONDE	.10	-.80	11.	18.12	2.68	117.
CLEARWATER	.55	-.77	41.	28.71	-.42	99.
SOUTHEAST WASHINGTON	.24	-.60	28.	17.32	-.41	98.
UPPER JOHN DAY	.07	-.79	9.	16.69	2.27	116.
UMATILLA/ LWR JOHN DAY	.10	-.62	13.	16.46	1.10	107.
UPR DESCHUTES/ CROOKED	.43	-.25	63.	19.19	4.94	135.
HOOD/ LOWER DESCHUTES	.07	-.69	9.	27.60	.13	100.
NW SLOPE WASH CASCADES	.52	-1.90	22.	73.47	-9.54	89.
SW WA CASCADES/COWLITZ	.19	-1.67	10.	64.05	-3.34	95.
WILLAMETTE VALLEY	.05	-1.15	4.	56.09	-.54	99.
ROGUE/ UMPQUA	.04	-.72	5.	42.27	7.75	122.
KLAMATH BASIN	.08	-.58	12.	22.51	5.02	129.
LAKE COUNTY-GOOSE LAKE	.05	-.56	8.	15.58	3.35	127.
HARNEY/ MALHEUR BASIN	.03	-.68	4.	15.95	4.49	139.

DIVISION VALUES ARE COMPUTED BY UTILIZING UN-WEIGHTED PRECIPITATION AMOUNTS FROM KEY STATIONS IN EACH AREA. NORMALS BASED ON 1961-1990. FOR FURTHER INFORMATION CONTACT: NWRFC (503) 326-7291.

SIMILAR TO JULY, HOT AND DRY CONDITIONS PREVAILED IN AUGUST FOR THE NORTHWEST. POCATELLO REPORTED THE SECOND DRIEST AUGUST ON RECORD. MANY SITES REPORTED RECORD HIGH TEMPERATURES OR TIED THE RECORD.

MEAN TEMPERATURES DEPARTED +2.8 DEGREES (31 STATIONS) FROM NORMAL FOR THE PACIFIC NORTHWEST RELATIVE TO 1961-1990 NORMALS. MEAN TEMPERATURE DEPARTURES RANGED BETWEEN 6.4 AND 0.1 DEGREES. RECORD HIGHS BAKED ASTORIA ON THE 28TH (78 DEGREES), PORTLAND ON THE 31ST (98 DEGREES, TIE), MEDFORD ON THE 4TH (108 DEGREES)

AND 31ST (104 DEGREES), KALISPELL ON THE 31ST (91 DEGREES, TIE), AND MISSOULA ON THE 29TH (94 DEGREES, TIE). KALISPELL REPORTED A RECORD LOW OF 33 DEGREES (TIE) ON THE 18TH.

AN EXITING TROUGH BROUGHT WHAT LITTLE PRECIPITATION FELL DURING THE MONTH TO THE EAST SIDE ON THE 1ST. HIGH PRESSURE, AN ALEUTIAN JET STREAM, AND WARMTH DOMINATED THE REST OF THE MONTH. A TROUGH DID SWEEP THROUGH BRITISH COLUMBIA ON THE 15TH - 17TH , WHICH DELIVERED THE REST OF THE MONTH'S PRECIPITATION TO THE EAST SIDE.

FOR AUGUST...PRECIPITATION WAS 48 PERCENT OF NORMAL (1961-1990) AT COLUMBIA ABOVE COULEE; 42 PERCENT OF NORMAL AT THE SNAKE RIVER ABOVE ICE HARBOR; AND 38 PERCENT AT COLUMBIA ABOVE THE DALLES.

end/nwrfc/kmartin

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US GEOLOGICAL SURVEY, WATER RESOURCES DIVISION
Oregon District
COMPARATIVE FLOW TABLE FOR JULY, 1998

Station	----- Monthly mean discharge -----		Change in dis- charge from	----- Discharge near end of month -----	Date	----- Accumulated Runoff -----
	Cubic feet per second	Percent of average	previous month (percent)	Cubic feet per second		Oct-May Percent of Average
John Day River at Service Creek, OR	966	153	-74	456	31	108
Wilson River nr Tillamook, OR	123	74	-52	90	31	110
Umpqua River nr Elkton, OR	2,130	135	-67	1,620	31	102
Columbia River at The Dalles, OR	219,000(a)	85	-45	169,000	31	104
Willamette River at Salem, OR	7,220(a)	122	-61	9,020	31	96
Chehalis River nr Grand Mound, WA	595	152	-36	480	31	113
Skykomish River nr Gold Bar, WA	2,075	56	-62	1,310	31	98
Spokane River at Spokane, WA	2,526(a)	89	-62	1,710	31	85
Snake River at Heise, ID	14,316(a)	127	-34	8,060	31	114
Snake River at Weiser, ID	15,801	134	-60	12,300	31	125
Salmon River at White Bird, ID	16,938	115	-50	9,590	31	101
Clearwater River at Spalding, ID	10,326	93	-60	5,400	31	87
Clark Fork at St. Regis, MT	10,640	129	-41	5,170	31	89
MF Flathead River nr West Glacier, MT	2,890	73	-56	1,740	31	81

Percent of Average computed using 30-year base period, Water Years 1961-90

(a) adjusted for upstream storage

08/05/98

Enc 2

US GEOLOGICAL SURVEY, WATER RESOURCES DIVISION

Oregon District

COMPARATIVE FLOW TABLE FOR AUGUST, 1998

Station	----- Monthly mean discharge -----		Change in dis- charge from	Discharge near end of month	-----	Accumulated Runoff
	Cubic feet per second	Percent of average	previous month (percent)	Cubic feet per second	Date	Oct-May Percent of Average
John Day River at Service Creek, OR	286	141	-70	151	31	108
Wilson River nr Tillamook, OR	76.6	73	-38	60	31	110
Umpqua River nr Elkton, OR	1,500	129	-30	1,470	31	102
Columbia River at The Dalles, OR	126,520(a)	91	-42	134,000	31	104
Willamette River at Salem, OR	4,760(a)	127	-34	7,810	31	97
Chehalis River nr Grand Mound, WA	432	169	-27	412	31	113
Skykomish River nr Gold Bar, WA	778	53	-63	583	31	97
Spokane River at Spokane, WA	1,186(a)	93	-53	990	31	85
Snake River at Heise, ID	5,990(a)	109	-58	4,620	31	113
Snake River at Weiser, ID	11,913	110	-25	12,300	31	125
Salmon River at White Bird, ID	6,419	110	-62	4,760	31	102
Clearwater River at Spalding, ID	3,792	97	-63	2,770	31	88
Clark Fork at St. Regis, MT	3,840	113	-64	2,900	31	90
MF Flathead River nr West Glacier, MT	1,170	82	-60	730	31	81

Percent of Average computed using 30-year base period, Water Years 1961-90

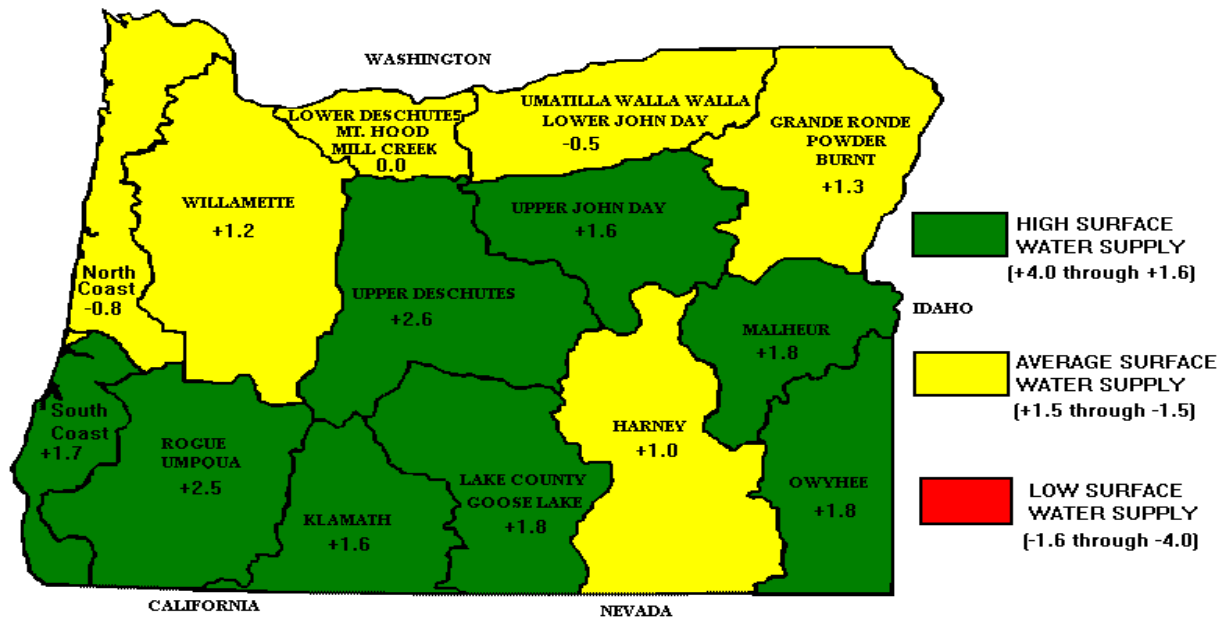
(a) adjusted for upstream storage

09/08/98

SURFACE WATER SUPPLY INDEX

(SWSI)

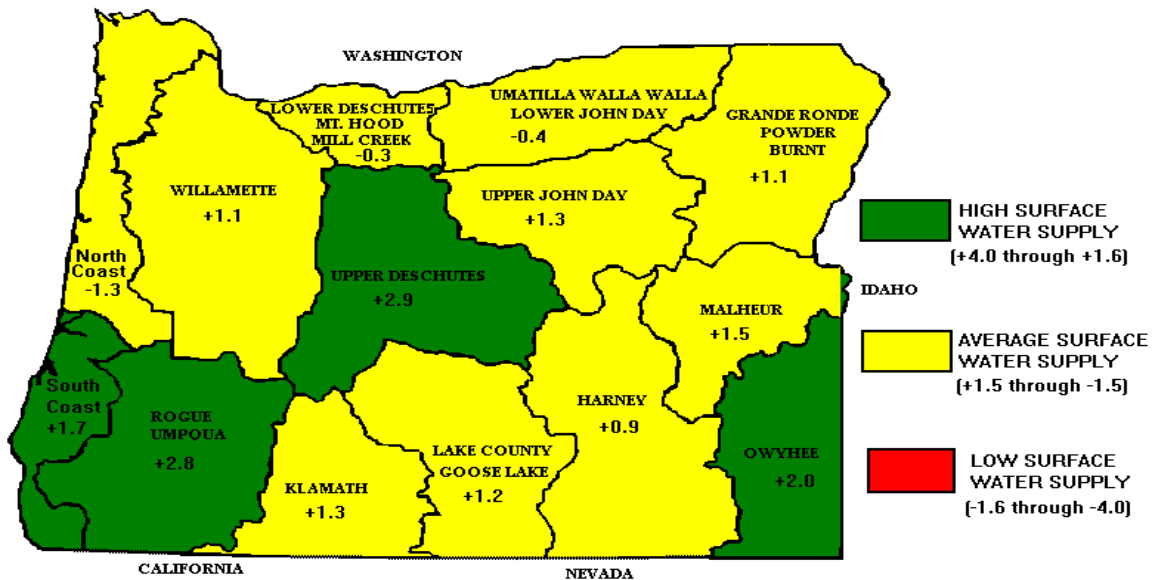
August 1, 1998



SURFACE WATER SUPPLY INDEX

(SWSI)

September 1, 1998



US BUREAU OF RECLAMATION, PACIFIC NORTHWEST REGION

Monthly Water Conditions Report End-of-Month Reservoir Contents for **July, 1998**:

<u>STATION - CODE</u>	<u>ACTIVE</u> <u>CAPACITY</u>	<u>1998</u>	<u>% OF</u> <u>CAPACITY</u>	<u>% OF</u> <u>NORMAL</u>	<u>% OF</u> <u>NORMAL</u>
HGH-AF-HUNGRY HORSE DAM & R	2981.20	***	***	2875.64	***
CMO-AF-COMO DAM AND LAKE ON	35.10	30.24I	86	26.01	116
Yakima River Basin					
CLE-AF-CLE ELUM LAKE, WA	436.90	288.82V	66	325.40R	89
KAC-AF-KACHESS LAKE, WA	239.00	217.02V	91	201.50	108
KEE-AF-KEECHELUS LAKE, WA	157.80	79.06V	50	127.50	62
RIM-AF-TIETON DAM & RIMROCK	198.00	172.65V	87	166.60	104
BUM-AF-BUMPING LAKE, WA	33.70	20.93V	62	29.60R	71
Columbia Basin					
GCL-AF-GRAND COULEE DAM & F	5185.45	4632.60V	89	5063.60	91
BNK-AF-BANKS LAKE NR GRAND	715.00	652.96V	91	631.96	103
POT-AF-O'SULLIVAN DAM & POT	332.20	***	***	102.52	***
Okanogan River Basin					
CCR-AF-CONCONULLY DAM & RES	13.00	***	***	8.42	***
CCL-AF-SALMON LK DAM & CONC	10.50	***	***	9.56	***
Snake River Basin					
JCK-AF-JACKSON LAKE NEAR MO	847.00	825.09V	97	644.55	128
PAL-AF-PALISADES RESERVOIR	1200.00	1116.42V	93	981.63	114
ISL-AF-ISLAND PARK RESERVOIR	135.20	125.76V	93	98.84	127
GRS-AF-GRASSY LAKE NR MORAN	15.20	***	***	13.09	***
RIR-AF-RIRIE RESERVOIR NEAR	80.50	79.30V	99	64.60E	123
AMF-AF-AMERICAN FALLS RES A	1672.60	1407.62V	84	1025.60	137
MIN-AF-MINIDOKA DAM & LAKE	95.20	94.13V	99	95.15	99
WOD-AF-LITTLE WOOD RESERVOIR	30.00	23.79V	79	16.73	142
Boise River Basin					
AND-AF-ANDERSON RANCH RES A	423.20	392.80O	93	354.42	111
ARK-AF-ARROWROCK RESERVOIR	286.60	220.47O	77	128.42	172
LUC-AF-LUCKY PEAK LAKE NEAR	264.40	264.10O	100	244.97	108
LOW-AF-LAKE LOWELL, ID	169.10	98.29O	58	90.51	109
Payette River Basin					
CSC-AF-CASCADE RESERVOIR AT	653.00	596.96O	91	572.42	104
DED-AF-DEADWOOD RESERVOIR N	161.90	150.91O	93	123.53	122
Weiser River Basin					
MAN-AF-MANN CR DAM & RES ON	11.10	7.60O	68	6.40E	119

Enc 4

Clearwater River Basin

RES-AF-LEWISTON ORCHARDS RE	3.00	1.54V	51	2.06E	75
SOL-AF-SOLDIERS MEADOW DAM,	2.37	2.58O	109	1.68E	154

Owyhee River Basin

OWY-AF-LAKE OWYHEE NEAR NYASSA	715.00	635.65O	89	480.74	132
WLD-AF-WILDHORSE RESERVOIR	71.50	65.92O	92	38.99	169

Malheur River Basin

BEU-AF-AGENCY VALLEY DAM &	59.90	44.85O	75	26.70	168
BUL-AF-BULLY CREEK RESERVOIR	30.00	23.99O	80	14.07E	171
WAR-AF-WARM SPRINGS RESERVOIR	191.00	147.04O	77	97.70	150

Powder River Basin

PHL-AF-MASON DAM & PHILLIPS	73.50	63.98O	87	51.85E	123
THF-AF-THIEF VALLEY RESERVOIR	17.40	11.78O	68	12.58E	94

Burnt River Basin

UNY-AF-UNITY RESERVOIR NEAR	25.20	17.52O	70	14.00	125
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Umatilla River Basin

MCK-AF-MCKAY RESERVOIR NR P	66.26	43.88V	66	34.41	128
CLS-AF-COLD SPRINGS DAM & R	38.33	7.49V	20	20.48	37

Deschutes River Basin

CRA-AF-CRANE PRAIRIE DAM &	55.30	41.32I	75	28.78	144
CRE-AF-CRESCENT LK DAM & LK	86.90	75.37V	87	50.67	149
WIC-AF-WICKIUP DAM & RES ON	200.00	150.08I	75	93.47	161
OCH-AF-OCHOCO DAM & RES ON	45.24	36.03I	80	26.84	134
PRV-AF-ARTHUR R BOWMAN DAM	152.80	132.67I	87	122.73	108
HAY-AF-HAYSTACK DAM & RES O	5.64	4.90I	87	4.22E	116
WAS-AF-WASCO DAM & CLEAR LA	11.90	4.96V	42	5.30	94

Rogue River Basin

AGA-AF-AGATE DAM AND RES ON	4.70	3.44I	73	2.69E	128
EMI-AF-EMIGRANT DAM & LK ON	39.00	31.82V	82	21.79	146
FIS-AF-FISH LK NR LAKE CR,	7.90	6.76I	86	5.40E	125
FOR-AF-FOURMILE LAKE, OR	15.60	14.27I	91	9.32E	153
HPD-AF-HOWARD PRAIRIE DAM &	60.60	57.20V	94	48.57E	118
HYA-AF-HYATT DAM & RES NR A	16.00	14.22V	89	11.76E	121

Tualatin River Basin

SCO-AF-SCOGGINS DAM AND HEN	53.60	43.85I	82	42.94E	102
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TOTAL OF 48 RESERVOIRS

15079.38	13180.61	87	12289.68	107
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AF is acre-feet. NORMAL is published 30-year average, 1961-1990. Please note that all data are PROVISIONAL and subject to revision. This report is updated monthly, after the 15th of each month.

US BUREAU OF RECLAMATION, PACIFIC NORTHWEST REGION

Monthly Water Conditions Report

End-of-Month Reservoir Contents for **August, 1998:**

STATION - CODE	ACTIVE CAPACITY	1998	% OF CAPACITY	AVG	% OF AVG
HGH-AF-HUNGRY HORSE DAM & R	2981.20	***	***	2784.11	***
CMO-AF-COMO DAM AND LAKE ON	35.10	11.92V	34	9.14	130
Yakima River Basin					
CLE-AF-CLE ELUM LAKE, WA	436.90	***	***	217.70R	***
KAC-AF-KACHESS LAKE, WA	239.00	183.37V	77	163.70	112
KEE-AF-KEECHELUS LAKE, WA	157.80	23.32V	15	77.90	30
RIM-AF-TIETON DAM & RIMROCK	198.00	155.77V	79	112.80	138
BUM-AF-BUMPING LAKE, WA	33.70	11.57V	34	19.40R	60
Columbia Basin					
GCL-AF-GRAND COULEE DAM & F	5185.45	4371.47V	84	5117.10	85
BNK-AF-BANKS LAKE NR GRAND	715.00	587.94V	82	629.41	93
POT-AF-O'SULLIVAN DAM & POT	332.20	***	***	64.80	***
Okanogan River Basin					
CCR-AF-CONCONULLY DAM & RES	13.00	***	***	5.91	***
CCL-AF-SALMON LK DAM & CONC	10.50	***	***	8.96	***
Snake River Basin					
JCK-AF-JACKSON LAKE NEAR MO	847.00	726.01V	86	535.00	136
PAL-AF-PALISADES RESERVOIR	1200.00	992.47V	83	844.52	118
ISL-AF-ISLAND PARK RESERVOIR	135.20	116.48V	86	66.55	175
GRS-AF-GRASSY LAKE NR MORAN	15.20	11.66V	77	10.85	107
RIR-AF-RIRIE RESERVOIR NEAR	80.50	77.12V	96	55.18E	140
AMF-AF-AMERICAN FALLS RES A	1672.60	977.89V	58	666.98	147
MIN-AF-MINIDOKA DAM & LAKE	95.20	94.71V	99	90.67	104
WOD-AF-LITTLE WOOD RESERVOIR	30.00	10.85V	36	8.89	122
Boise River Basin					
AND-AF-ANDERSON RANCH RES A	423.20	347.84V	82	309.07	113
ARK-AF-ARROWROCK RESERVOIR	286.60	67.97V	24	38.58	176
LUC-AF-LUCKY PEAK LAKE NEAR	264.40	260.95V	99	192.04	136
LOW-AF-LAKE LOWELL, ID	169.10	70.20V	42	64.57	109
Payette River Basin					
CSC-AF-CASCADE RESERVOIR AT	653.00	508.65V	78	478.53	106
DED-AF-DEADWOOD RESERVOIR N	161.90	116.84V	72	80.19	146
Weiser River Basin					
MAN-AF-MANN CR DAM & RES ON	11.10	3.60V	32	3.61E	100

Clearwater River Basin

RES-AF-LEWISTON ORCHARDS RE	3.00	0.94V	31	1.56E	60
SOL-AF-SOLDIERS MEADOW DAM,	2.37	**. **	***	1.11E	***

Owyhee River Basin

OWY-AF-LAKE OWYHEE NEAR NYS	715.00	541.95V	76	403.56	134
WLD-AF-WILDHORSE RESERVOIR	71.50	59.09V	83	32.48	182

Malheur River Basin

BEU-AF-AGENCY VALLEY DAM &	59.90	31.00V	52	14.67	211
BUL-AF-BULLY CREEK RESERVOIR	30.00	18.12V	60	9.64E	188
WAR-AF-WARM SPRINGS RESERVOIR	191.00	108.32V	57	72.44	150

Powder River Basin

PHL-AF-MASON DAM & PHILLIPS	73.50	45.45V	62	39.43E	115
THF-AF-THIEF VALLEY RESERVOIR	17.40	6.06V	35	7.73E	78

Burnt River Basin

UNY-AF-UNITY RESERVOIR NEAR	25.20	9.74V	39	8.34	117
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Umatilla River Basin

MCK-AF-MCKAY RESERVOIR NR P	66.26	31.38V	47	17.68	178
CLS-AF-COLD SPRINGS DAM & R	38.33	6.44V	17	8.93	72

Deschutes River Basin

CRA-AF-CRANE PRAIRIE DAM &	55.30	38.20V	69	25.19	152
CRE-AF-CRESCENT LK DAM & LK	86.90	67.79V	78	41.80	162
WIC-AF-WICKIUP DAM & RES ON	200.00	124.12V	62	67.16	185
OCH-AF-OCHOCO DAM & RES ON	45.24	29.59V	65	20.89	142
PRV-AF-ARTHUR R BOWMAN DAM	152.80	118.55V	78	108.46	109
HAY-AF-HAYSTACK DAM & RES O	5.64	4.58V	81	4.79E	96
WAS-AF-WASCO DAM & CLEAR LA	11.90	**. **	***	4.70	***

Rogue River Basin

AGA-AF-AGATE DAM AND RES ON	4.70	2.35V	50	1.68E	140
EMI-AF-EMIGRANT DAM & LK ON	39.00	21.88V	56	12.88	170
FIS-AF-FISH LK NR LAKE CR,	7.90	5.24V	66	4.30E	122
FOR-AF-FOURMILE LAKE, OR	15.60	10.95V	70	6.82E	161
HPD-AF-HOWARD PRAIRIE DAM &	60.60	53.18V	88	45.12E	118
HYA-AF-HYATT DAM & RES NR A	16.00	12.33V	77	10.07E	122

Tualatin River Basin

SCO-AF-SCOGGINS DAM AND HEN	53.60	33.80V	63	33.95E	100
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TOTAL OF 46 RESERVOIRS	14643.41	11109.68	76	10574.25	105
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AF is acre-feet. AVG is published 30-year average, 1961-1990. Please note that all data are PROVISIONAL and subject to revision. This report is updated monthly, after the 15th of each month.

3-AUG-1998 16:19:47 U.S. BUREAU OF RECLAMATION

YAKIMA PROJECT [Data for July 1998]

SYSTEM STATUS AT 08:00

RESERVOIR	TOTAL CONTENT	PERCENT CAPACITY	RESERVOIR CAPACITY	RESERVOIR INFLOW	RESERVOIR RELEASES
	<u>AF</u>	<u>AF</u>	<u>%</u>	<u>CFS</u>	<u>CFS</u>
Keechelus	74669.	157800.	47.	42.	981.
Kachess	214596.	239000.	90.	92.	536.
Cle Elum	274070.	436900.	63.	390.	3552.
Bumping	19920.	33700.	59.	101.	313.
<u>Rimrock</u>	<u>173225.</u>	<u>198000.</u>	<u>87.</u>	<u>405.</u>	<u>277.</u>
TOTALS	756480.	1065400.	71.	1029.	5659.

IRRIGATION DIVERSIONS

RIVER FLOWS

-----	CFS	-----	CFS
Kittitas	1141.	Yakima River near Easton	448.
Roza	1082.	Yakima River at Cle Elum	4076.
Yakima-Tieton	94.	Teanaway River bl. Forks	29.
Wapato	1859.	Yakima River at E'Burg	4105.
Sunnyside	1304.	Yakima River at Umtanum	4342.
		Naches River nr. Clf'Del	621.
MAJOR USERS TOTAL	5479.	Tieton R. bl. Can. Hdws	123.
		Naches River nr. Naches	143.
Westside	96.	Yakima River at Parker	504.
Naches-Selah	132.	Yakima River at Prosser	832.
	OTHERS ABOVE PARKER	1295.	

	TOTAL ABOVE PARKER	6774.
	Kennewick	299.

	OTHER CANAL DIVERSIONS

	Wapatox	409.
	Roza	1867.
	Chandler	1212.

UNREGULATED TRIBUTARY & RETURN FLOW ABOVE PARKER - - 1620. CFS

OPERATIONAL COMMENTS:

KEECHELUS -- +49 CFS.,

CLE ELUM -- +30 CFS.,

TOTAL JULY'S PRECIP. IS 42% OF MONTH'S AVERAGE.

3-AUG-1998 16:19:47 U.S. BUREAU OF RECLAMATION
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Naches-Selah	132.	Yakima River at Prosser	832.
	OTHERS ABOVE PARKER	1295.	
	TOTAL ABOVE PARKER	6774.	
	Kennewick	299.	
	OTHER CANAL DIVERSIONS		
	Wapatox	409.	
	Roza	1867.	
	Chandler	1212.	

UNREGULATED TRIBUTARY & RETURN FLOW ABOVE PARKER - - 1620. CFS

OPERATIONAL COMMENTS:

KEECHELUS -- +49 CFS.,

CLE ELUM -- +30 CFS.,

TOTAL JULY'S PRECIP. IS 42% OF MONTH'S AVERAGE.

**CORPS OF ENGINEERS, NORTH PACIFIC DIVISION
REPORT FOR SEPTEMBER 1998 CRWMG MEETING**

LIBBY. The reservoir began July near elevation 2454 feet. The TMT agreed to operate Libby between 12 and 18 kcfs in July. Between July 14 - 16, flow was reduced to 4 kcfs to assist authorities in recovering two drowning victims at Troy. The maximum Libby elevation for the year was 2458.33 feet on 16 July. The end of July elevation was 2457.33 feet. The Libby/Arrow swap was again implemented this year in which the Canadians agreed to release water from Arrow in lieu of the Americans releasing water the full amount of water from Libby for salmon called for in the Biological Opinion. This resulted in a swap of about 210 KAF. The Libby elevation at the end of August was 2443.87 feet instead of a non-swap elevation of 2439 feet. The observed April through August runoff volume was 5838 KAF, 92 percent of normal. The July and August inflow was 73% and 81% of average, respectively.

ALBENI FALLS. During July and August 1998 Lake Pend Oreille operated within the top one half foot between elevations 2062.0 and 2062.5 feet. The average outflows in July and August were 30 kcfs and 14 kcfs, respectively. The annual September draft started after Labor Day on 8 September. Target is elevation 2060 feet at the end of September and 1998-99 winter minimum elevation of 2055.0 feet by about 15 November. The unregulated inflow to Lake Pend Oreille was 85% of average in July and August.

DWORSHAK. Dworshak remained within one foot of full through July 10 at which time the Technical Management called for water from Dworshak to augment Lower Granite flows. By July 21 the outflow was increased to 20 kcfs. This outflow was held through the end of July and the pool drafted to 1561.9 by that date. On August 1 the outflow was decreased to minimum flow to assist the sheriff in recovering a drowning victim. Outflows were increased again on August 3 to 14 kcfs (110% tdg) and were gradually reduced to 3 kcfs by the end of August. The pool drafted to 1520.32 feet by the end of August. Outflows are currently 1.3 kcfs (minimum flow) and are expected to remain at this level through December. The December 15 flood control elevation is 1558 feet. The unregulated inflow to Dworshak was 83% of average in July and August.

LOWER SNAKE PROJECTS. Lower Granite July and August inflow was 136% of average. Lower Monumental and Little Goose are operating at MOP to MOP + 1 as a soft constraint but are expected returned to normal operating pool levels in mid-September to submerge fish ladder entrances at Little Goose and Lower Granite in order to facilitate adult passage. flip lip construction work started again at Ice Harbor in September. Goal is no spill and to maintain enough storage in reservoir to give the contractor at least 3 hours to vacate downstream work area before spilling.

WILLAMETTE BASIN PROJECTS. All Willamette projects were operated in accordance with the summer flow augmentation plan in July and August. Salem and Albany flows did not drop below the minimum water quality flow targets in July or August. Salem dropped 200 cfs below it's minimum flow of 7000 cfs on September 1 but has remained at or above it's minimum flow since then. All but two projects are currently drafting for flood control. Construction projects at Fall Creek and Fern Ridge have delayed the fall draft at these locations. Both projects were drafted below their rule curves before construction started and will re-start their draft at the end of September All projects are expected to reach minimum pool by the end of November.

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